

# PATENT SPECIFICATION

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## COMPLETE SPECIFICATION.

### Improvements in or relating to a Method of Blanching or Pre-Cooking Peas, Beans and the like and Apparatus for Carrying Out the Method.

We, MITCHELL ENGINEERING LIMITED, a British Company, of 1 Bedford Square, London, W.C.1, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a method for blanching or pre-cooking peas, beans and like products and also to an apparatus for carrying out the method. Whilst the invention is applicable to peas, beans and the like whether dried, fresh or soaked, it will, without any implied restriction thereto, be described with reference to the treatment of peas.

An object of the invention is to provide an improved method and apparatus for carrying out the blanching or pre-cooking of peas which is economical in operation and by means of which the peas may be treated much more rapidly and efficiently than with currently used methods.

In our co-pending Application No. 14367/55 (Serial No. 814,872) there is described and claimed a method of blanching or pre-cooking peas or the like which comprises continuously feeding dried, fresh or soaked peas into a vessel, spraying the peas with water to form a surface film thereon, and maintaining the moistened peas at a predetermined temperature for a predetermined time by passing them in counter-current to a circulation of steam to blanch or pre-cook the peas to a required degree and continuously separating the treated peas from the supernatant liquid, the peas being sprayed with sufficient water to maintain a surface film thereon during the time said peas are maintained at said predetermined temperature.

[Price 3s. 6d.]

In accordance with the present invention a method is provided of blanching or pre-cooking peas or the like which comprises continuously passing dried, fresh or soaked peas into a vessel and through a preheated prepared aqueous liquid contained therein at a rate such that the duration for which said peas are immersed in said liquid at the temperature to which said liquid is preheated is sufficient to blanch said peas, discharging said peas from the vessel in a stream of liquid passing through a conduit opening into the bottom of the vessel and extending upwardly therefrom, the stream of liquid in the conduit being maintained by the head of liquid in the vessel, the treated peas being subsequently separated from the liquid and the liquid recirculated to the vessel.

The apparatus for carrying out the invention essentially comprises a vessel having means to feed peas into the upper end thereof, means at or near the top of the vessel to maintain the liquid level therein substantially constant and a discharge outlet opening at or near the bottom of the vessel. The discharge opening communicates with a discharge conduit to carry a stream of liquid and treated peas from the vessel to a separator where the peas are separated from the liquid and from whence the liquid is recirculated, after heating if necessary, to the vessel.

The discharge conduit may comprise a rising tube extending upwardly from the bottom of the vessel and thence to the separator, the tube at no point rising to or above the liquid level in the vessel.

In order that the invention may be clearly understood, an embodiment thereof will now be described by way of example, with reference to the accompanying diagrammatic

drawing in which there is shown a section through an apparatus according to the invention.

In the drawing there is shown an upright vessel 16 which is open at the top for the introduction of peas, and is provided with a central vertical tube 17 and with a series of perforated frusto-conical baffles 18 through which the central tube passes, these baffles being spaced from the central tube 17 but making contact at their outer edges with the inner walls of the vessel. In addition, the central tube is provided with a series of upright frusto-conical baffles 19 which extend outwardly from the tube and are disposed alternately to the baffles 18.

The upper end of the vessel is provided with a hopper 21 to direct a continuous supply of peas into the vessel. Sprays or other liquid inlets 22 are arranged at the upper end of the vessel and, if desired, at other levels also and feed liquid into the vessel to maintain the level therein constant. To ensure that the level does remain constant an overflow 23 is provided, and to maintain the temperature in the vessel at the required level the incoming liquid is preheated by the heater 24.

The lower part of the vessel is provided with discharge outlet 25 which leads into an upright conduit 26 which extends substantially vertically to a level some distance below the liquid level in the vessel where it connects with a horizontal or downwardly inclined conduit leading to a separator 27.

It will be seen that with this arrangement, if a continuous supply of peas is fed to the top of the vessel and the liquid level is maintained constant, the head of liquid in the vessel above the level of the top of the discharge pipe will force the peas in the lower part of the vessel together with the liquid in which they are contained up the outlet conduit and into the separator and the process will be continuous.

The separator 27 may be of any suitable form for separating the peas from the liquid and is provided with a pipe 29 for returning the separated liquid to the vessel for further use. Any convenient means such as, for example, a steam coil may be provided for heating the liquid which may be recirculated to the vessel from a pump 28 so that the water entering the vessel is at boiling point or at any other desired temperature. The diameter and/or height of the discharge conduit may be so arranged that the peas will move down through the vessel at such a speed that they will be immersed in the hot liquid for the time required to effect adequate blanching or pre-cooking.

The outlet tube is provided with a valve or closure plug (not shown) of any suitable form so that the movement and extraction of the peas can be stopped when required.

#### WHAT WE CLAIM IS:—

1. A method of blanching or pre-cooking peas or the like which comprises continuously passing dried, fresh or soaked peas into a vessel and through a preheated prepared aqueous liquid contained therein at a rate such that the duration for which said peas are immersed in said liquid at the temperature to which said liquid is preheated is sufficient to blanch said peas, discharging said peas from the vessel in a stream of liquid passing through a conduit opening into the bottom of the vessel and extending upwardly therefrom, the stream of liquid in the conduit being maintained by the head of liquid in the vessel, the treated peas being subsequently separated from the liquid and the liquid recirculated to the vessel.

2. Apparatus for carrying out the method of Claim 1 comprising a vessel having means to feed peas or the like into the upper end thereof, means at or near the top of the vessel to introduce liquid into said vessel to maintain the liquid level therein substantially constant and a discharge outlet opening at or near the bottom of the vessel, said discharge outlet communicating with a discharge conduit to carry a stream of liquid and treated peas from said vessel under the pressure of the head of liquid maintained in said vessel.

3. Apparatus according to Claim 2 wherein said discharge conduit carries said peas and liquid to a separator where the peas are separated from the liquid and from whence the liquid is returned to the vessel.

4. Apparatus according to Claim 2 or 3 wherein a heater is provided to bring said liquid to a predetermined temperature before it is introduced into said vessel.

5. Apparatus according to Claim 3 or 4 wherein said discharge conduit comprises a rising tube extending upwardly from the bottom of said vessel and thence to said separator, said tube at no point rising to or above the liquid level in said vessel.

6. Apparatus according to any one of Claims 2 to 5 wherein a system of baffles is provided within the vessel to control the passage of peas therethrough and to maintain spaces within the vessel to allow for the expansion of the peas as they absorb water.

7. Apparatus according to Claim 6 wherein said baffles are perforate.

8. Apparatus according to Claim 6 or 7 wherein said baffles are in the form of a sequence of upright and inverted frusto-conical members arranged alternately within the vessel.

9. Apparatus according to any of Claims 6 to 8 wherein said system of baffles includes a tube extending axially of the vessel.

10. A method of blanching or pre-cooking

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peas or the like substantially as hereinbefore specifically described.

11. Apparatus for carrying out the method of Claim 1 or Claim 10 substantially as hereinbefore specifically described with reference to the accompanying drawing.

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#### PROVISIONAL SPECIFICATION.

#### Improvements in or relating to a Method of Blanching or Pre-Cooking Peas, Beans and the like and Apparatus for Carrying Out the Method.

- We, MITCHELL ENGINEERING LIMITED, a British Company, of 1 Bedford Square, London, W.C.1, do hereby declare this invention to be described in the following statement:—

- This invention relates to a method of and apparatus for blanching or pre-cooking peas, beans and the like, and hereinafter for convenience termed peas, and has for its main object to provide an improved method and apparatus for the said purpose which is economical in operation and by means of which large quantities of peas may be blanched or pre-cooked as rapidly and as efficiently as possible.

- The invention accordingly consists in a method of blanching or pre-cooking peas which comprises continuously feeding dry fresh or soaked peas into a vessel containing prepared liquid heated to a predetermined temperature, allowing said peas to pass down said vessel so as to be immersed in said heated liquid for a predetermined time interval so as to effect blanching or pre-cooking, utilising the head of liquid in the vessel to force the blanched or pre-cooked peas into an extractor and recirculating the liquid from the extracted peas back to the vessel.

- The invention also consists in apparatus for carrying out the method defined in the preceding paragraph comprising an upright vessel which is provided with means at or near the top for introducing a continuous supply of dry, fresh or soaked peas and means at or near the bottom of the vessel for introducing a supply of heated liquid, said vessel also having a discharge outlet at or near the bottom of the vessel communicating with an extracting or collecting device through a rising tube or conduit the greatest height of which is less than the total height of said vessel whereby the head of liquid in said vessel causes a continuous supply of liquid and blanched or pre-cooked peas to be discharged into said extracting or collecting device.

- According to the preferred arrangement, the aforesaid vessel is provided with a series of perforated frusto-conical shaped mem-

bers disposed at spaced intervals in the vessel for ensuring a continuous downward movement of the peas and a continuous inflow of liquid through the peas, the vessel also having a central tube passing through said members for keeping the centre of the vessel clear of peas, and with hopper means for directing the incoming peas into the vessel outside said central tube.

In carrying the invention into effect in one convenient manner, I construct my improved apparatus in the form of an upright chamber or vessel which is open at the top for the introduction of dry peas, and is provided with a central vertical tube and with a series of perforated inverted frusto-conical members through which the control tube passes, these aforesaid conical members being spaced from the central tube but making contact at their outer edges with the inner walls of the vessel, the perforations in such members being so dimensioned as to prevent the passage of peas of any size likely to be used. In addition, the central tube is provided with a series of upright frusto-conical members which extend outwardly from the tube and are spaced apart at intervals so as to be disposed within or between the aforesaid inverted frusto-conical members, the major diameter of the upright frusto-conical members being less than that of the chamber or vessel in which they are disposed, so that the two sets of frusto-conical members being oppositely disposed with respect to each other form an annular passageway for the peas of substantially zig-zag form.

The upper end of the vessel is provided with a hopper which is so arranged as to direct a continuous supply of dry peas into the vessel outside the central tube while the lower end of the vessel is provided with an inlet for supplying heated liquid to the base of the vessel which is separated from the lowermost inverted frusto-conical member so that the liquid on entering the apparatus percolates freely through the perforated members and through the body of peas which descend slowly through the vessel, the perforated members forming a series of sections or pockets clear of peas which become

filled with liquid which thus circulates freely from one section to another as the peas move downwards, a large percentage of liquid being absorbed by the peas during their travel.

The lower part of the vessel is also provided with an outlet which leads into an upright pipe or conduit which extends substantially vertically either through the central tube or outside the outer casing to a level some distance below the top of the vessel where it connects with a horizontal or downwardly inclined pipe leading to an extractor or collecting device.

It will be seen that with this arrangement, if a continuous supply of peas is fed to the top of the vessel and prepared liquid in which the peas are to be sterilized, such as for example water mixed with tomato sauce and other ingredients, heated to a predetermined temperature is supplied to the bottom of the vessel so that the latter is substantially filled with peas and heated liquid, the head of liquid in the vessel above the level of the top of the outlet pipe will force the peas in the lower part of the vessel together with the liquid and is preferably provided with a the outlet tube or conduit into the extractor or collector, and provided the supply of

peas and liquid is maintained, the process will be continuous.

Alternatively, this operation may be effected or assisted by a suitable form of ejector or pump thus enabling the contents of the vessel to be raised to a height equal to, or above that of the top of the vessel.

The extractor or collector may be of any suitable form for separating the peas from the liquid in which they are contained up pipe for returning the separated water to the vessel for further use. Any convenient means such as, for example, a steam coil or heater may be provided for heating the liquid which may be supplied to the vessel from a pump under pressure so that the water entering the vessel is at or above boiling point, and the diameter and/or height of the outlet tube may be so arranged that the peas will move down through the vessel at such a speed that they will be immersed in the hot water for the time required to effect adequate blanching or pre-cooking.

The outlet tube is provided with a valve or closure plug of any suitable form so that the movement and extraction of the peas can be stopped when required.

MARKS & CLERK.

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1 SHEET

COMPLETE SPECIFICATION

This drawing is a reproduction of the Original on a reduced scale.

